

THE SCIENCE NEWS-LETTER

A Weekly Summary of Current Science

EDITED BY WATSON DAVIS

ISSUED BY
SCIENCE SERVICE

B and 21st Streets
WASHINGTON, D. C.

EDWIN E. SLOSSON, Director
WATSON DAVIS, Managing Editor



SUBSCRIPTION: \$5 A YEAR, POSTPAID

The News-Letter, which is intended for personal, school or club use, is based on Science Service's Daily Science News Bulletin to subscribing newspapers. For this reason, publication of any portion of the News-Letter is strictly prohibited without express permission.

Vol. VIII, No. 268

Saturday, May 29, 1926

ALL WARS CHEMICAL WARS

All wars are chemical wars, even though poison gases are not used, and the victory goes not to the strong but to the ingenious and inventive. This is the keynote of an address delivered by Dr. Edwin E. Slosson, director of Science Service, before the recent meeting of the National Conference on International Problems and Relations.

Dr. Slosson said, in part:

"Wars are no longer fights between armies. They are contests between peoples. Nowadays the battle is not to the strong, but rather to the ingenious. It is quite likely that in the next war - if there is a next war - the decisive factor will be neither cavalry, infantry nor artillery, and it is quite possible that it will be something not yet taught in military academies or discussed in peace societies. It may be something as unexpected as were cavalry to the Aztecs or muskets to the Indians. Against such unknowables neither military preparedness nor peace treaty can protect in advance. The most effective form of preparedness is scientific research and industrial development in general.

"The disconcerting feature of the new weapons of warfare is that they are concealed weapons. In January 1914, the Germans knew just how many dreadnoughts the British had, and the British knew just where the Germans had laid their railroads for the invasion of Belgium. But the Germans could not guess that the British would be rushing tanks through their lines, and the British could not divine that the Germans would be showering them with dichlorethyl sulfide. Nitroglycerin can be made in a kitchen from three common chemicals, and phosgene is no harder to make than hooch. Infernal machines can be secretly constructed by men who have no more sense than to be anarchists, and any skilful mechanic could rig up an automatic airplane capable of dropping fire, poisons and explosives on an enemy area. No international police could 'frisk' a nation for concealed weapons of this sort. So limitation of armaments means merely that there shall be no more parades.

"Modern warfare, like modern manufacture, might therefore serve as a sort of intelligence test between peoples were it not for the fact that nations, like students, cheat in examinations. They loan their minds out as they loan out their money. The redskins of America, who belonged culturally to the Stone Age, were often armed with better rifles than our soldiers, and the Riffians use artillery and airplanes that they could never invent.

"Nowadays fighting is carried on with chemical formulas, and the nation that invents the best one beats. That Germany was able to hold out so long against encir-

clinging armies was due less to Hindenburg than to Haber, who discovered how to extract nitrogen for explosives from the air that blew over the blockade.

"War has been virtually a branch of applied chemistry ever since the invention of gun powder, or even since the forging of the first steel sword from the ore. The question now pending is, therefore, not the elimination of chemical warfare but its limitation to the older and less effective forms.

"The aversion against 'villainous saltpeter'; the stink-pot of the Malay pirates, and the Greek fire which saved Constantinople from the Mohammedans, is at bottom the same as the abhorrence excited by submarines, airplane bombing and poison gas in the late war. It is essentially a reaction against war itself. The modern weapons of warfare are more efficient but not more deadly or more cruel than the old. Cain killed Abel as dead as any man has been killed since, and no more ingenious means of inflicting suffering have been invented than those employed by Nebuchadnezzar in his campaigns. Further advance of the art of war in this direction is forever impossible.

"The methods of warfare changed so rapidly during the late war, that if the United States had been completely prepared in 1914 its equipment would have been out of date when the United States entered in 1917. A large part of the thirty-five thousand articles necessary to equip a modern army was of a type unknown when the Great War began. For war had for the first time in history entered the third dimension with airplanes above the surface of the ground, and submarines below the surface of the water.

"Now we are given to understand that the War Department knows where to go to get each item of 700,000 components of the military equipment needed, and arrangements are being made with 20,000 manufacturing plants of the country to supply them according to specifications. Against preparedness of such a sort even a pacifist cannot object.

EVOLUTION SHOULD BE TAUGHT TO ALL STUDENTS, SAYS BOTANIST

Instruction in evolution for all college students is advocated in a recent number of Science by Dr. John M. Coulter, formerly head of the department of botany at the University of Chicago and now associated with the Boyce Thompson Institute for Plant Research at Yonkers.

There are at least three important reasons why evolution should be regarded as a necessary part of college training, Dr. Coulter says.

"It has revolutionized modern thought. Every subject today is being attacked on the basis of its evolution. Not only are inorganic and organic evolution being considered, but also the evolution of language, of literature, of society, of government, of religion. In other words, it is a point of view which represents the atmosphere of modern investigation in every field.

"It is persistently misunderstood. From the press, the lecture platform and even the pulpit, one frequently hears or reads amazing statements in reference to

organic evolution. If it were made an essential feature of student training, there would be developed a propaganda of information instead of misinformation.

"It has revolutionized agriculture. The practical handling of plants and animals, in the way of improving old forms and securing new ones, was made possible and definite when the laws of inheritance began to be uncovered through experimental work in evolution."

The idea of evolution is no new thing under the sun, Dr. Coulter declares. "It is as old as our record of men's thought," he says, "for all the old mythologies are full of it. No modern man, therefore, is responsible for the idea, although it is a common misconception to load this responsibility upon certain distinguished modern students of evolution. For example, the name of Darwin is so conspicuous in connection with evolution that many seem to think that Darwinism and evolution are synonymous."

Dr. Coulter divides the history of evolutionary thought into three periods, comparing them with the ancient, medieval and modern epochs in the development of civilization. The first, or ancient period is by far the longest, occupying all known time until a little over a century and a quarter ago. During this time men merely speculated about the possibility of the process - it was a part of philosophy rather than of actual, objective science.

The "medieval" period was one of observation of natural phenomena, and deductions from the observations, without much testing of the conclusions in the laboratory or garden. This period began in 1790, with the work of St. Hilaire, Goethe, and Erasmus Darwin, the grandfather of Charles Darwin. It virtually corresponded with the nineteenth century, and the present great names of evolutionary theory belong to it, including Charles Darwin himself.

The "modern" period, in Dr. Coulter's classification, has only begun, but it has already borne very important fruits in the fields of plant and animal breeding and even of human eugenics. Dr. Coulter is of the opinion that the future food supply of the world's increasing population is dependent on an intelligent appreciation and application of the data made available by studies of evolution.

As for its status as a theoretical science, Dr. Coulter states that it is taken as a matter of course by scientists everywhere. What differences of opinion exist are only on questions of detail. He says:

"The present status of evolution as a body of doctrine may be said to be in a state of flux, out of which the truth will emerge eventually. Any meeting of biologists at which evolution is discussed discloses considerable diversity of opinion, not as to the fact of evolution, but as to some attempt to explain the process."

Farm wages, which figure so prominently in production costs, were higher in 1925 than they have been in any year since 1920.

KENTUCKY STUDENTS SAY EVOLUTION HELPED FAITH

Evolution, though the target of the Fundamentalists of Kentucky who for several years have tried to get it banned by legislation similar to that of Tennessee, does not harm the religion of university students but rather helps it, if the testimony of the students themselves be accepted. Dr. Austin R. Middleton, of the University of Louisville, stated in his address as retiring president of the Kentucky Academy of Science, that he had questioned his classes concerning the possible effects of the doctrine. Of 132 essays on the subject written by the students, only five held that evolution was not true. Of the remainder eighty writers stated that their religious beliefs had been strengthened, and not one student, even among the five opposed to evolution, claimed that the teaching of the theory tended to weaken faith.

GOLD TRANSMUTATION CLAIMS MAKE GERMAN CHEMISTS ROW

Gold from mercury - was it really made by Prof. A. Miethe in his electric tube?

This question, which has been agitating the scientific world for the past two years, was thrashed out at a hot session of the German Chemical Society at Berlin, crowded with dramatic situations and personal clashes of the debating scientists.

The opponents of the claims of Prof. A. Miethe and Dr. Hantaro Nagaoka, who independently worked out the process by which they claim to have produced gold from a baser metal, massed an attack against the German and Japanese scientists, and were met by the stout defense of their supporters.

Prof. E. Riensenfeld of the University of Berlin declared that distillation of mercury to absolute purity was impossible - that there would always be traces of gold present to vitiate the results of the experiment. Prof. E. Tiede of the same University presented a flat counter-claim, stating that he had obtained pure mercury, gold-free, without difficulty; but he added that when he repeated Prof. Miethe's experiment the results were wholly negative.

Prof. Fritz Haber, famous for his contribution to the solution of the fixed nitrogen problem, outlined the extreme difficulty of obtaining absolutely pure mercury, and of keeping it pure throughout the long course of an experiment. The presence of gold even at a distance, as in the operator's spectacle-frames or in metal compounds in an adjoining room, he said, might spoil the experiment through being drawn in ultramicroscopic quantities into the electric current, by an effect like that of the cathode rays.

Prof. E. Duhme stated that mercury always contains traces of gold, but that these may not be capable of detection except after considerable ageing of the mercury by standing, or even by being subjected to an electric current.

The end of the session was enlivened by a personal clash between Prof. Haber and Dr. H. Stammreich, Prof. Miethe's assistant.

Prof. Miethe in an interview with a representative of Science Service stated he sees no present reason for changing his views. The process really active in

changing mercury into gold, he said, is still unknown, and consequently success in a repetition of his experiments is possible only by chance. He intends to publish his work in full at an early date, and in the meantime he will exchange his apparatus with other experimenters, to eliminate possible sources of errors due to differences in construction.

Prof. Miethe stated that in forty-two experiments the output of gold was constantly proportional to the amperage of the current and to the time of the process. When repeated with all conditions identical but without turning on the current the result was negative.

The purification of mercury for the experiment is a very difficult distillation, probably involving a complicated atomic process not yet well understood. Much further research on this detail alone is needed, Prof. Miethe said. He stressed also the dangers involved by the extremely poisonous nature of the mercury vapors.

DATES SIEGE OF TROY BY ECLIPSE OF SUN

The Trojan War, sung by Homer in his Iliad, began in 1197 B. C., and the famous wooden horse got through the walls, opening the way for the destruction of the city, in 1187 B. C. Ulysses got home to Ithaca after his long wanderings ten years after that, and at 8:30 on the evening of April 13, 1177 B. C., he sent an arrow through the last of the suitors who had been pestering his faithful wife Penelope.

This exact dating of events that happened three thousand years ago has been made possible by the calculations of an astronomer, Dr. Schoch of Heidelberg. Using the regular astronomical methods for ascertaining the dates of eclipses, and making allowance for the retardation of the earth since the time of Homer by the brake-like action of the oceanic tides, Dr. Schoch used as his basic date the total eclipse of the sun recorded in the twentieth book of the Odyssey, where Theoclymenus addresses Penelope's suitors as follows:-

"Ah, unfortunate men, what horror is that that has happened!

Shrouded in night are faces and heads. To the hands it descendeth.

See, too, crowded with ghosts is the porch and crowded the courtyard.....

Withered and gone is the sun and the poisonous mist is arising."

The view that these lines and those following described a total eclipse was taken by Plutarch and by medieval commentators.

Dr. Schoch examined the century within which the siege of Troy and the return of Ulysses are said to have fallen, namely 1240-1140 B. C. He concludes that the total solar eclipse of 1177 B. C. can alone be taken into consideration. In this year, on April 16, the sun was totally eclipsed in the island of Ithaca at 11:41 a.m. local mean time. He reconstructs the events of that day, as recounted in the Odyssey, and

on the assumption that this eclipse really was historical, restores the chronology of the Trojan war and subsequent events as follows:-

Trojan War	B. C.	1197-1187
Fall of Troy	"	1187
Wanderings of Ulysses	"	1187-1177
Landing on Scheria	"	1177 beginning of April
Landing on Ithaca	"	1177 April 12
Slaughter of Suitors	"	1177 April 16 6 to 8:30 p.m.,

The fact that the eclipse appears, from the calculation, to have been total on Ithaca, is an important piece of evidence. The path of totality over the earth is an extremely narrow one at all times, and it is highly improbable that there has been a total eclipse in that particular spot since the time of Ulysses.

Dr. Schoch's table supplements from a different angle the attempts, hitherto entirely archaeological, to fix the date of the Trojan war. Some few years ago, several large clay tablets were dug up at Boghaz-Keui in Asia Minor. They were inscribed in cuneiform characters, such as were used by the Babylonians and the Assyrians, but were in a hitherto unknown language, almost certainly Hittite. Herr Forrer, a Swiss philologist, who claims to have deciphered some of them, states that one describes an invasion of Asia Minor during the reign of a Hittite king, who is known to have occupied the throne about fifty years before the traditional date of the Siege of Troy. Until Dr. Schoch made his calculations, this was thought to have taken place about 1172 B. C. The invaders were described as Achaeans, commanded by Atreus, who was the father of Agamemnon and Menelaus. From the Boghaz-Keui tablets, if Forrer deciphered them correctly, it would appear that the Greeks were planning to seize various districts in Asia Minor, and that Helen was a mere pretext for the war with Troy.

NEW PREHISTORIC FOOTPRINTS BROUGHT FROM GRAND CANYON

New finds of footprints of reptiles left in soft sand at least 25,000,000 years ago have just been made in sandstone 1,800 feet down from the rim of the Grand Canyon and have been brought to Washington. This is the greatest depth in the canyon at which such prints have been found.

The prehistoric tracks were found by Charles W. Gilmore, curator of vertebrate paleontology of the National Museum, and will be added to the government's fine collection of footprints of the Permian Age. Mr. Gilmore, who has just returned to Washington, spent three weeks in Arizona, and obtained from the canyon a ton and a half of material containing fossil tracks of reptiles and prints of plants.

These ancient prints can be used as evidence to assist geologists in determining more exactly the age of the beds of rock in which they were found, said Mr. Gilmore.

"The fact that the prints were found 1,800 feet from the top of the canyon means that after these queer, long extinct reptiles impressed their feet in what was then moist sand, almost 2,000 feet of rock material was slowly piled up in successive strata above the prints," he explained. "And this does not take into account many

additional hundreds of feet of material that have been eroded off from the present top of the canyon wall. So the length of time required for the deep canyon to form was obviously stupendous."

The level at which the fossil plants and reptiles have been located belongs to the later part of the carboniferous period, or the time when the great coal beds of the world were being formed, and was a few million years before the famous reign of the dinosaurs.

One specimen brought back by Mr. Gilmore shows a row of tracks very much like mouse tracks impressed in a small slab of red stone, and in among the tiny footprints is a wavy line which represents the track of the animal's tail. Other exhibits show prints larger than a man's hand, indicating that some of the reptilian creatures of this age may have become as large as crocodiles. No bones of these creatures have been found in the Grand Canyon, though some bones of reptiles making similar tracks have been found elsewhere.

The plant specimens have not yet been studied by a museum specialist, but some of them are fern-like plants, the prints of which are several feet tall.

ITALIAN SURGEONS PERFORM UNIQUE GLAND GRAFT

People whose hopes of eternal youth were dashed by the failure of the rejuvenating effects of gland transplantation to persist may yet take heart. Two physicians of Florence have performed an operation which bolsters up the failing hope that gland grafting had put a new weapon in the hands of the medical profession for subduing hitherto unconquerable disease.

Drs. Cesare Frugoni and Vittorio Scimone have just announced through the *Presse Medicale* the results of treating a case of tetany, a chronic disease resembling lock-jaw, with a graft of human parathyroid, one of the small glands placed around the better known thyroid in the neck. The technique followed was that of Dr. Serge Voronoff, one of the original experimenters in transferring glands from apes to humans.

The results were almost instantaneous, according to the authors. The patient, released from the terrific pain suffered during six or seven long attacks every day, picked up amazingly. Tests made some time later still showed a slight parathyroid deficiency but the ingrafted piece was still firmly attached under the skin five months after the operation.

The question of greatest concern to physicians with respect to the case is how long the gland will persist, for the laws that govern a graft's chance of survival comprise one of the subjects on which the medical profession is still in the dark.

Editorial comment apropos this aspect in the *Lancet* says: "Much of the interest of the case depends on how long the graft will survive, but it has served to prove the

connection between chronic tetany and parathyroid deficiency and to demonstrate the advantage of Veronoff's innovation. Even if the hopes of the authors are destroyed by the ultimate disappearance of this, as of most grafts, they have at any rate made a substantial contribution to the resources of gland therapy."

OILED FEATHERS FORM INSULATING AIR MATTRESS

The feathers of aquatic birds serve both as an air cushion and as a heat insulator. Prof. Joseph Barcroft of King's College, Cambridge, in a Royal Institution lecture recently said that the reason waterfowl do not sink like other ordinary vertebrates in water is on account of the air retained in their feathers. The water does not work into the interstices between the frills of the feathers because they are so completely oiled that they never get wet even on the surface.

The air imprisoned in the feathers also serves to keep the bird warm. The hardihood of water birds in this respect is fairly manifested by the familiar sight of ducks swimming in the ice-bound spaces of lakes and rivers, apparently enjoying themselves.

"It is not that the separation of a surface of cold water by an inch or so of air from the body of the bird would keep it warm," said Prof. Barcroft, "but convection currents would be set up which would rapidly cool the bird". Caught up, however, in the fine mesh work of feathers the air is almost motionless and being a very poor conductor the body warmth is all retained.

AUSTRALIA SEEKS CACTUS ENEMIES

The prickly pear cactus is advancing in Australia at the rate of a million acres a year. Leith F. Hitchcock of the Australian Commonwealth Prickly Pear Board estimates that already 60,000,000 acres of East Australia alone are infested with this spiny pest.

Mr. Hitchcock has just arrived at the field station of the U. S. Bureau of Entomology at Uvalde, Texas, to take charge of the North American phase of Australia's war on the prickly plant. So kindly has the cactus taken to the climate of the isolated continent that it occupies more than twice as much land as all the other crops put together, and so desperate have the inhabitants become that every sort of enemy that the cactus ever had in any part of the world is being drafted into service in the wild hope that it will help check its spread.

For that purpose the Australian Prickly Pear Board has sent out men to the arid regions of the Southwest to collect specimens of the various types of insects that prey on the prickly pear. Thus far, according to Mr. Hitchcock, different species of the mealy bugs or cochineal insects have been found most successful. The insects are grown in cages at the entomological station here and the most vicious attackers of the cactus are shipped to Australia. There the authorities, taking warning from

the rapid increase of the artificially introduced rabbit and the cactus itself, grow the insects in quarantine through at least one generation before they turn them loose to do their worst.

SMITH AND JOHNSON LEADING U. S. SURNAMES

The expression, "As common as Smith, Brown and Jones", is not based upon scientific investigations, but it is a close approach to the facts, according to a report by Howard F. Barker, of Riverdale, Md., in a recent issue of American Speech.

The three most popular surnames of America are, Smith, Johnson, and Brown, according to Mr. Barker, who has lately made a study of the frequency of surnames. Smith is a name borne by more than one in each hundred of our population. Johnson has come into second place; and even Brown and Williams have taken the lead over Jones.

Certain cities show peculiarities of their own. The name Johnson leads in St. Paul and Minneapolis, for instance, by virtue of being a favorite name among Scandinavian-Americans. Smith leads in New York City with Cohen, Miller, Brown, and Schwartz following in the order named. In Chicago, Johnson leads again; in Boston, Smith leads with Sullivan close on its heels.

There are more Smiths and Johnsons in the United States than there are people in Detroit. The Browns brought together would fall little short of making a city the size of Boston. The Williamses total somewhat more, the Joneses somewhat less than the population of Los Angeles, the Millers could almost take command of Pittsburgh; the Davises would fill San Francisco or Buffalo.

The number of people bearing our ten leading names in a 112,000,000 total are as follows: Smith, 1,304,300; Johnson, 1,024,200; Brown, 730,500; Williams, 684,700; Jones, 658,300; Miller, 625,800; Davis, 537,900; Anderson, 477,300; Wilson, 422,300; Moore, 363,400. The ten names are all from the British Isles and may be traced to different parts of the islands.

TABLOID BOOK REVIEW

THE DECLINE OF THE WEST. By Oswald Spengler. New York: Knopf. 1926. \$6.00.

At last a publisher has been found with the courage to carry out the translation of this colossal work. If not an epoch-making book, it is undeniably an epoch-marking book. Though prepared before the war, *Der Untergang des Abendlandes* measures the depths of despair into which the war has plunged thinking men of both the victorious and defeated nations, alike victims of the Great Catastrophe. In scope of conception, profusion of learning, boldness of generalization, impressiveness of utterance, eloquence of language, Spengler ranks with the German philosophers of the old school, with Hegel, Schopenhauer and Hartmann. He also shows the characteristics of the German philosopher in his overloading of sentences, cloudiness of meaning,

arrogance of assertion and intolerance of opposing opinion. It is a work a thinker can afford to ignore, however much he may disagree with its thesis.

According to Spengler's theory Europe passed from the stage of Culture to that of Civilization in 1800, and has before it the stage of Caesarism, lasting from 2000 to 2200 A. D. The present disintegration of European states into minor nationalities is the beginning of a gradual decomposition of folk-organisms into amorphous masses of men. These will be ultimately reabsorbed into one empire which will in the course of time degenerate into the character of a primitive Asiatic despotism. The final stage of decadence, coming after the year 2200, is that of "Egyptianism, Mandarinism and Byzantinism," a static and torpid state in which the imperial mechanism will grow gradually weaker and the country will become at length the booty of younger peoples or foreign robbers, resulting in a relapse into the dark ages and finally into the chaos of primeval savagery.

Dr. Spengler believes that he has discovered the universal formula that will define the course and forecast the future of the history of all human institutions, and modes of thought, whether political, industrial, esthetic, scientific, religious or philosophical. He brings history into the field of natural history, and makes of it merely a form of comparative morphology. The historian is to him an idle and impotent spectator. He can describe but not prescribe. For the world lives out its life in such invariable sequences as the seven ages of man.

DISEASE PREVENTION. By H. H. Waite. New York: Thomas Y. Crowell Company. 1925. \$4.50.

The art and practise of war against disease is all compactly set forth in this one convenient volume, which deserves a place on all public library shelves, and is a book that public health officials, sanitary engineers and even thoroughly awake general medical practitioners simply cannot afford to be without. The material it contains has hitherto been so diffusely scattered in reference and text books and special articles in epidemiology, bacteriology, parasitology and a dozen other fields that access to a reasonably complete medical library has been necessary to make it available. For this reason the book should be especially valuable to workers in small or isolated communities, or to the field sanitarian whose work is always in the nature of a flying campaign.

READINGS IN THE STORY OF HUMAN PROGRESS. By Leon C. Marshall. New York: Macmillan.

Intended for junior high school, but nobody is too old to find them readable, and nobody too wise that he will not learn something from them. These "Readings" range from the past of the Cro-Magnon man to the future of simplified spelling.
